

1      **CLAIMS**

2      What is claimed is:

3  
4      1.     An apparatus comprising:

5                user mode logic;

6                kernel mode logic; and

7                kernel mode to user mode interface logic configured to receive at  
8                least one data packet over a shared communication port and selectively  
9                distribute said data packet to either said user mode logic or said kernel  
10          mode logic.

11  
12        2.     The apparatus as recited in Claim 1, wherein said kernel mode to  
13          user mode interface logic further includes:

14                bridge logic configured to individually determine if said received  
15          data packet is a user mode data packet that is to be selectively distributed to  
16          said user mode logic or a kernel mode data packet to be selectively  
17          distributed to said kernel mode logic.

18  
19        3.     The apparatus as recited in Claim 2, further comprising:

20                memory operatively coupled to said bridge logic, and wherein said  
21          bridge logic is further configured to store a plurality of user mode data  
22          packets in said memory.

1       4. The apparatus as recited in Claim 3, wherein said bridge logic is  
2       configured to store said plurality of user mode data packets in said memory  
3       in a queued buffer configuration.

4  
5       5. The apparatus as recited in Claim 3, wherein said kernel mode to  
6       user mode interface logic further includes:

7             miniport logic operatively coupled to said bridge logic and said  
8       memory and configured to selectively retrieve at least one of said plurality  
9       of user mode data packets stored in said memory and provide said at least  
10      one retrieved data packet to said user mode logic.

11  
12       6. The apparatus as recited in Claim 3, further comprising:

13             a physical network communication port operatively coupled to said  
14       bridge logic and configurable to receive both user mode data packets and  
15       kernel mode data packets from an external device.

16  
17       7. The apparatus as recited in Claim 1, wherein:

18             said user mode logic is further configured to generate at least one  
19       outgoing user mode data packet;

20             said kernel mode logic is further configured to generate at least one  
21       outgoing kernel mode data packet; and

22             said kernel mode to user mode interface logic is further configured  
23       to receive said outgoing user mode data packet from said user mode logic  
24       and said outgoing kernel mode data packet from said kernel mode logic.

- 1       8. The apparatus as recited in Claim 5, wherein:
- 2              said bridge logic is configured to receive said outgoing kernel mode
- 3              data packet from said kernel mode logic; and
- 4              said miniport logic is configured to receive said outgoing user mode
- 5              data packet from said user mode logic and further configured to store a
- 6              plurality of outgoing user mode data packets in said memory.
- 7
- 8       9. The apparatus as recited in Claim 8, wherein said miniport logic is
- 9              configured to store said plurality of plurality of outgoing user mode data
- 10             packets in said memory in a queued buffer configuration.
- 11
- 12      10. The apparatus as recited in Claim 8, wherein said bridge logic is
- 13              further configured to selectively retrieve at least one of said plurality of
- 14              outgoing user mode data packets stored in said memory.
- 15
- 16      11. The apparatus as recited in Claim 10, further comprising:
- 17              a physical network communication port operatively coupled to said
- 18              bridge logic and configurable to send both user mode data packets and
- 19              kernel mode data packets to an external device; and
- 20              wherein, said bridge logic is configured to provide said outgoing
- 21              kernel mode data packet and said retrieved outgoing user mode packet to
- 22              said network communication port.
- 23
- 24      12. The apparatus as recited in Claim 2, further comprising:
- 25

1                   at least one processing unit operatively configured to selectively run  
2                   in kernel mode or user mode; and wherein said bridge logic includes virtual  
3                   bridge logic provided by said processing unit while running in said kernel  
4                   mode.

5  
6                 13. The apparatus as recited in Claim 5, further comprising:

7                   at least one processing unit operatively configured to selectively run  
8                   in kernel mode or user mode; and wherein said miniport logic includes  
9                   virtual miniport logic provided by said processing unit while running in  
10                  said user mode.

11  
12                14. The apparatus as recited in Claim 2, wherein said kernel mode logic  
13                  further includes:

14                   kernel mode debugging logic coupled to said bridge logic.

15  
16                15. The apparatus as recited in Claim 5, wherein said user mode logic  
17                  further includes:

18                   network protocol logic operatively coupled to said miniport logic;  
19                  and

20                   application level logic operatively coupled to said network protocol  
21                  logic.

22  
23                16. The apparatus as recited in Claim 6, wherein said physical network  
24                  communication port is configurable to provide a network connection to a  
25                  TCP/IP network.

1  
2     17. The apparatus as recited in Claim 6, wherein said physical network  
3 communication port is configurable to provide a network connection to the  
4 Internet.

5  
6     18. The apparatus as recited in Claim 6, wherein said apparatus is  
7 included within a device having only one said physical network  
8 communication port.

9  
10    19. A method comprising:

11                 providing at least one processing unit to selectively run user mode  
12 logic and kernel mode logic;

13                 receiving at least one data packet through a shared communication  
14 port; and

15                 while said processing unit is running said kernel mode logic,  
16 selectively handling said data packet for use with either said user mode  
17 logic or said kernel mode logic.

18  
19    20. The method as recited in Claim 19, wherein selectively handling said  
20 data packet for use with either said user mode logic or said kernel mode  
21 logic further includes:

22                 determining if said received data packet is a user mode data packet  
23 for use by said user mode logic or a kernel mode data packet for use by said  
24 kernel mode logic; and

1                   storing received data packets determined to be user mode data  
2                   packets in memory.

3  
4                 21. The method as recited in Claim 20, wherein storing received data  
5                   packets determined to be user mode data packets in memory further  
6                   includes storing a plurality of such user mode data packets in said memory  
7                   in a queued buffer configuration.

8  
9                 22. The method as recited in Claim 20, further comprising:

10                 while said processing unit is running said user mode logic,  
11                 selectively retrieving at least one stored user mode data packet from said  
12                 memory, and

13                 providing said at least one retrieved data packet to said user mode  
14                 logic.

15  
16                 23. The method as recited in Claim 19, wherein said shared  
17                 communication port includes a physical network communication port  
18                 operatively configurable to receive both user mode data packets and kernel  
19                 mode data packets from an external device.

20  
21                 24. The method as recited in Claim 19, further comprising:

22                 while said processing unit is running said user mode logic, causing  
23                 said user mode logic to generate at least one outgoing user mode data  
24                 packet, and storing said at least one outgoing user mode data packet in said  
25                 memory; and

1 subsequently, while said processing unit is running said kernel mode  
2 logic, causing said kernel mode logic to send said at least one outgoing user  
3 mode data packet stored in said memory through said shared  
4 communication port.

5  
6 25. The method as recited in Claim 24, wherein storing said at least one  
7 outgoing user mode data packet in said memory further includes storing a  
8 plurality of plurality of outgoing user mode data packets in said memory in  
9 a queued buffer configuration.

10  
11 26. The method as recited in Claim 19, further comprising:

12 while said processing unit is running said kernel mode logic, causing  
13 said kernel mode logic to generate at least one outgoing kernel mode data  
14 packet, and sending said at least one outgoing kernel mode data packet  
15 through said shared communication port.

16  
17 27. The method as recited in Claim 19, wherein said kernel mode logic  
18 includes debugging logic.

19  
20 28. The method as recited in Claim 19, wherein said user mode logic  
21 includes network protocol logic and application level logic.

22  
23 29. The method as recited in Claim 19, wherein said processing unit is  
24 included within a device having only one physical network communication  
25 port, which operates as said shared communication port.

1  
2       30. A computer readable media having computer instructions for  
3 performing acts comprising:

4                 selectively running at least one processing unit using either user  
5 mode logic or kernel mode logic;

6                 receiving at least one data packet through a shared communication  
7 port; and

8                 while running said kernel mode logic, selectively handling said data  
9 packet for use with either said user mode logic or said kernel mode logic.

10  
11       31. The computer readable media as recited in Claim 30, wherein  
12 selectively handling said data packet for use with either said user mode  
13 logic or said kernel mode logic further includes:

14                 determining if said received data packet is a user mode data packet  
15 for use by said user mode logic or a kernel mode data packet for use by said  
16 kernel mode logic; and

17                 storing received data packets determined to be user mode data  
18 packets in memory.

19  
20       32. The computer readable media as recited in Claim 31, wherein storing  
21 received data packets determined to be user mode data packets in memory  
22 further includes storing a plurality of such user mode data packets in said  
23 memory in a queued buffer configuration.

1       33. The computer readable media as recited in Claim 31, having further  
2 computer instructions for performing acts comprising:

3              while said processing unit is running said user mode logic,  
4 selectively retrieving at least one stored user mode data packet from said  
5 memory, and

6              providing said at least one retrieved data packet to said user mode  
7 logic.

8

9       34. The computer readable media as recited in Claim 30, wherein said  
10 shared communication port includes a physical network communication  
11 port operatively configurable to receive both user mode data packets and  
12 kernel mode data packets from an external device.

13

14       35. The computer readable media as recited in Claim 30, having further  
15 computer instructions for performing acts comprising:

16              while said processing unit is running said user mode logic, causing  
17 said user mode logic to generate at least one outgoing user mode data  
18 packet, and storing said at least one outgoing user mode data packet in said  
19 memory; and

20              subsequently, while said processing unit is running said kernel mode  
21 logic, causing said kernel mode logic to send said at least one outgoing user  
22 mode data packet stored in said memory through said shared  
23 communication port.

1       36. The computer readable media as recited in Claim 35, wherein storing  
2       said at least one outgoing user mode data packet in said memory further  
3       includes storing a plurality of plurality of outgoing user mode data packets  
4       in said memory in a queued buffer configuration.

5  
6       37. The computer readable media as recited in Claim 30, having further  
7       computer instructions for performing acts comprising:

8                 while said processing unit is running said kernel mode logic, causing  
9        said kernel mode logic to generate at least one outgoing kernel mode data  
10      packet, and sending said at least one outgoing kernel mode data packet  
11      through said shared communication port.

12  
13       38. The computer readable media as recited in Claim 30, wherein said  
14      kernel mode logic includes debugging logic.

15  
16       39. The computer readable media as recited in Claim 30, wherein said  
17      user mode logic includes network protocol logic and application level logic.

18  
19       40. The computer readable media as recited in Claim 30, wherein said  
20      processing unit is included within a device having only one physical  
21      network communication port, which operates as said shared communication  
22      port.